

## **Diel Habitat Selection by Juvenile Chinook Salmon in the Cedar River, Washington**

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**Abstract:** We studied juvenile chinook salmon diel habitat use and preference in the Cedar River from February to July 1999. Habitat use was determined using snorkeling methods and habitat was classified using a 5-level hierarchical system. The first level of this system delineated the channel type as main, side, braided, or slough. Classification at levels two through four was based on the habitat characteristics of the entire channel width. Level 5 was used to characterize small distinct secondary habitats within the larger habitat. Habitat was classified as deep or shallow water in level two. Deep and shallow water was further classified as scour or dammed pool (deep water); or turbulent or non-turbulent, respectively in level three. Levels four and five classified the habitat by the type of pool (lateral scour, eddy, etc.) or riffle (riffle, rapid, cascade, etc.). Habitat selection did not vary consistently diurnally or seasonally. Juvenile chinook salmon used off channel habitats such as slough and side channels extensively and preferred these habitats to main channel habitats when mid-channel habitats were included. However, no preferences existed when mid-channel habitats were not included in the analysis. Juvenile chinook salmon in the main channel preferred secondary habitats associated with the bank and avoided mid-channel areas. They avoided lateral scour habitats both day and night and preferred eddy habitats at night. Multiple logistic regression analysis showed that chinook salmon presence at night was influenced most by water temperature, habitat area, average velocity, maximum depth, overhanging cover, and sediment size. Significant interactions also existed between temperature and overhanging cover, and habitat area and sediment size. The probability of chinook being present was negatively related with average velocity, maximum depth, and sediment size. Chinook presence showed a slight positive relationship with temperature, habitat area, and overhanging cover.

